

# The American FERTILIZER

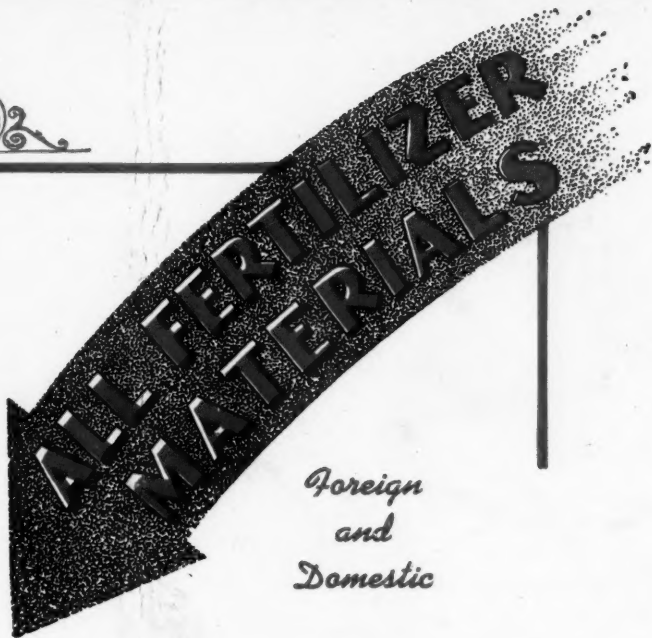


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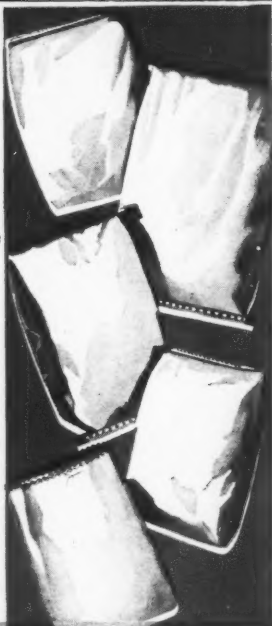
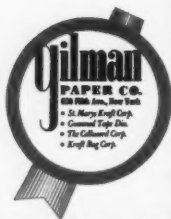


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# The American FERTILIZER

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No. 2

## Grassland Agriculture

Agricultural Leaders Hear Talks on Many Aspects of Pasture Cultivation  
at Meeting Sponsored by Joint Committee on Grassland Farming

**O**VER 200 agricultural leaders met in Chicago on December 19th to discuss the problems of grassland farming. The meeting was sponsored by the Joint Committee on Grassland Farming, representing the National Fertilizer Association, the American Society of Agronomy, Soil Science Society of America, American Society of Agricultural Engineers, American Dairy Science Association, American Society of Animal Production, National Association of Silo Manufacturers, and the Farm Equipment Institute.

Kirk Fox, editor of *Successful Farming*, presided and a well-rounded list of talks had been prepared which included the scientific angles as presented by leading agronomists as well as the practical aspects from the point of view of the grassland farmer himself. Through the courtesy of Warren Huff, chairman of the Coke Oven Ammonia Research Bureau, we are able to present some of the principal points emphasized by the speakers.

### Building Soils with Grasslands

J. B. Peterson

A system of grassland agriculture offers one of the greatest and very effective means of building and maintaining the productivity of our soils, according to J. B. Peterson, Head of the Agronomy Department, Purdue University, Lafayette, Ind. Dr. Peterson, using illustrations and supplemental data, showed how grasses and legumes improved soils.

### A Grassland Approach to Farm Management

D. Howard Doane

D. Howard Doane of the Doane Agricultural Service speaking to the grassland group said, "New types of beef and dairy animals capable of handling big volumes of roughage, with big jaws, wide heads, deep bodies and wide spring of ribs are needed to meet the increasing trend toward maximum pasture and hay use."

With prospects of falling prices, he said, "We must produce livestock and livestock products at lower costs. The route to these lower costs is through increased use of pasture. We know that pasture is our cheapest feed and feed is the largest single item of cost. The quality of beef produced from pasture alone can be made equivalent to much of the short-fed beef that goes to market. An acre of grass will produce as much beef as an acre in any other crop and grass will make as fast gains as the best harvested feed."

Doane said that on his own farm, individual steers out of bunches of feeders selected for the best likelihood of making big gains fast, have made 400 pounds of gain in 100 days of feeding on pasture.

Referring to relatively recent interest in winter grazing in the southern states, he said, "Twelve months grazing is successful as far north as Iowa and northern Illinois. In Florida they have produced 1,996 pounds of beef from one acre of grass in one year. High

nutrient forage, when fed exclusively is making about 85 per cent as much milk as can be obtained from the standard hay and grain ration. Hay and grass silage is now grown and stored for half our former costs."

Mr. Doane definitely implied that grassland farming does not mean using any old pasture or hay, and said, "The crops grazed must be of highest quality made so by correct selection of species and varieties of grass and legumes and by abundant well balanced fertilization. By high quality, we mean high mineral and protein content. By this means, we can double nutrient intake while holding quantity and hours of grazing constant."

Citing what can be accomplished through fertilization, Doane said, "On land that can be bought for \$50 to \$60 an acre, always considered non-corn land, we are now growing 100 bushels of corn per acre. As ordinarily farmed, this land will produce 25 bushels of corn per acre. In properly adapted crops when grazed by efficient animals, it produces the equivalent of 87 bushels or 300 pounds of beef per acre. A balanced fertilization program plays a most important role in animal and human health."

The future of the livestock industry is okay, he said, if we can make meat, milk and eggs at lower cost. The tools for doing so are at hand. They are proved and efficient. It is up to farmers to learn how to use them.

#### **What Grassland Mechanization Can Do for the Farmer**

*Paul Mazur*

Paul Mazur, owner of Fiddler's Creek Farm, Titusville, N. J., emphasized the importance of simple and inexpensive equipment for harvesting, handling, storing, and feeding forage crops during the winter months. Mr. Mazur indicated some new developments which may revolutionize the storage and feeding of grass silage. He said, in effect, that climbing up a 40-foot silo, pitching out silage, climbing down the silo again, and then carrying the silage to a cow just does not make sense. Mr. Mazur suggested the practical possibilities of self-feeding hay barns and self-feeding silos.

#### **Grassland Equipment Today and Tomorrow**

*Frank Kranick*

Mr. Frank Kranick of Racine, Wis., really took a comprehensive inventory of today's grassland farming equipment and then suggested some equipment changes which would make grassland farming more attractive and more profitable. He said, "Grassland farming is a program of agricultural economics for

those who grow forage of various kinds. It has a dual role to play in this plan. First, it is a means of getting more feed value out of forage crops and at the lowest unit cost. Second, it is a plan for one of the best practices in land use and soil conservation that is known today. There is no better method to advocate that will enlarge the farmer's margins, and at the same time maintain soil fertility, both of which will produce a permanent and a healthy agricultural situation."

Mr. Kranick submitted information showing what happens to hay when it is handled with some of our present day equipment. He quoted from Bulletin No. 4 of the Wisconsin Agricultural Experiment Station published in February, 1946, which says, "In 1946 it was estimated that if Wisconsin farmers were to buy sufficient protein feeds to replace the protein lost in the leaves in making of hay, it would cost them better than \$100,000,000, or an amount equal to their 1946 bill for purchase feed."

In discussing equipment for the future Mr. Kranick indicated that we do not necessarily want a machine which will do the job with the least number of man hours. He said, "It is not a question entirely of man hours, it is a question of a good product at the lowest cost, which involves the price of the machine and its capacity and its ability to produce, the livestock, or the milk that gives the operator, the farmer, the greatest margin for the capital invested. There are more farmers with thin pocket-books and small acreage than those with large incomes. It is well to supply equipment to serve their needs because in the aggregate they provide meat and milk for more people."

#### **The Nutritional Significance of Grassland Farming**

*R. E. Hodgson*

Dr. Ralph E. Hodgson, Bureau of Dairy Industry, U. S. D. A., Washington, D. C., presented some figures that really put grass and pasture on a pedestal from the standpoint of their importance in our agricultural economy. He said, "Almost two-thirds of the nation's dairy products, three-fourths of our beef and 91 per cent of our meat from sheep and goats is produced from grasses and legumes."

"Grasses and legumes that are well fertilized and managed can provide all of the protein, most of the minerals and vitamins and a large percentage of the total digestible nutrients for all but the highest producing of our dairy cows," Hodgson said.

"Good combinations of grasses and legumes on well fertilized soil will produce one-third



more total digestible nutrients and considerably more protein than will the same amount of land divided between corn and small grains," Hodgson asserted. "The cost of 100 pounds of total digestible nutrients from grass runs about 29 cents. An equal amount from corn would be \$1.29. In hay this 100 pounds of total digestible nutrients would cost 49 cents and in corn silage, 91 cents."

Dr. Hodgson substantiated Mr. Kranick's emphasis on the importance of reducing losses during harvesting operations. Dr. Hodgson said, "Good harvesting methods are needed, to cut serious losses of feed nutrients in forage. Protein losses on alfalfa in one cutting amounted to 233 pounds for rain-damaged hay and 144 pounds for non-rain damaged hay in tests at Beltsville, Md. On rain-damaged hay that would be enough protein to take care of 64 days requirements for a 1,200 pound cow producing 40 pounds of 4 per cent milk."

Hodgson reported that "Protein losses have been cut more than 50 per cent by harvesting forage as grass silage or by barn drying of hay. These improved practices, particularly the silage method are more efficient in preserving the carotene content of grassland crops. This is reflected in a higher vitamin A content in the milk produced by cows fed these feeds."

### Grassland Farming and the Dairy Farmer

John B. Abbott

John B. Abbott, a long time grassland farmer of Bellows Falls, Vt., said from his own experience and observation that grassland farming is not new. He said, "Grassland farming as the basis of animal husbandry of one sort and another is not a new system of agriculture. I have seen excellent meadows in the British Isles which had not been plowed up since the time of the Napoleonic wars and I was told that the permanent sward was so highly valued that the meadows were leased only with the proviso that they be not plowed up."

Mr. Abbott said that hay crops do not need to take a back seat to any other crops. He said, "The meadow crops compare favorably with the grain crops as producers of nutrients on the acre basis and best them by a wide margin on the unit cost of nutrient basis. An acre of hay yielding three tons in two cuttings—a moderate yield—produces about 3,000 pounds total digestible nutrients, which is roughly equivalent to 70 bushels of corn or 125 bushels of oats or seven and one-half tons of corn silage. And the acre cost of producing the hay in a long rotation with seeding costs spread over five to eight years is far less than

the acre cost of producing the grain crops or corn silage. Yield and cost of production figures show an equal or greater advantage for meadow crops used for grass silage and grazing."

Mr. Abbott had an interesting and significant statement to make regarding feed grain concentrates. He said, "Feed salesmen frequently call on me at the farm and expound the splendid qualities of their several products at length. When I have about all I can take I reply as follows: 'Brother, if my roughage is abundant enough and good enough, and it is as I have corrected all of the known plant food deficiencies of the soil on which it was grown, used good seeding mixtures, harvested the crop on time and cured it properly, then differences between two supplemental concentrates do not matter much. With such roughage in quantity I shall get good production with almost any concentrate. And, on the other hand, if my roughage were not good the difference between two concentrates would not matter much either as I certainly should lose money anyway.' That reply, if they know anything at all about feeding a dairy cow, usually holds them and ends the sales talk."

Citing another advantage of grassland farming, Mr. Abbott said, "At this point let me interject the statement that, old as I am, I have never seen a season which did not provide good enough growing conditions at some time during the season to produce an adequate supply of roughage from meadow crops. I have seen seasons too wet or too dry at critical times for the grain crops or for half-starved meadow crops but I have yet to see a failure of the meadow crop in the hands of a really good farmer. Maybe the crop was made early on residual moisture from the winter snowfall—that is by all odds the best bet—or maybe it was made on summer rains, but always there was a crop *if the farmer provided the necessary plant food to take full advantage of the rain when it came.* For a man with a herd to feed that is a point worth remembering."

Experience really is the best teacher, because Mr. Abbott after his many years of experience concluded by saying, "The next problem after providing a season-long supply of grazing is that of harvesting and curing the first cutting of meadow crops without impairment of quality. The books say that a ton of early-cut, perfectly cured legume grass mixture is worth at least three-fourths as much to feed as a ton of 16 per cent dairy feed—but try to cure such a crop perfectly in late May or early June!

(Continued on page 28)



### **Rutland Promoted by International Minerals & Chemical Corp.**

The appointment of John W. Rutland as general sales manager of the plant food division of International Minerals & Chemical Corporation has been announced by President Louis Ware.

Mr. Rutland, who has literally grown up with the fertilizer industry, joined the company in 1921. He had been general sales



**John W. Rutland**

manager of the potash division since 1948, and previously had served as southern potash sales manager. Earlier, he had served in the sales organization of the plant food division.

In his new capacity, Mr. Rutland will have general supervision of plant food sales under Maurice H. Lockwood, vice president in charge of the plant food division. Mr. Rutland will exercise administrative direction of the division in Mr. Lockwood's absence.

### **Cocke Elected Director of Atlanta National Bank**

Emory L. Cocke, Vice President of Ashcraft-Wilkinson Company was elected a director of the First National Bank of Atlanta at the January 10th meeting of the bank stockholders.

Mr. Cocke has been connected with Ashcraft-Wilkinson Company since 1919. He became manager of the Feed Department in 1924, was elected Assistant Secretary in 1927, and Vice President in 1934.

He is also President of the Suni-Citrus Products Company, Haines City, Florida; Vice Chairman of Exposition Cotton Mills Company, Atlanta; President, Interstate Mills, Inc., Cairo, Illinois; director of Planters Products Company, Donaldsonville, Georgia; director and member of Permanent Rules Committee of Grain and Feed Dealers Mutual Association; member of the Classification Committee of American Feed Manufacturers Association; and a member of the Arbitration Committee of the National Cotton Seed Products Association.

### **Connecticut Experiment Station to Celebrate 75th Anniversary**

Plans are under way for a year-long observance of the 75th anniversary of the founding of the Connecticut Agricultural Experiment Station, oldest in America. Throughout 1950, a series of meetings will be held in New Haven, climaxing on September 28th and 29th, with a special two-day celebration of the event.

Meetings scheduled for the near future include regional meetings of the Northeastern Soils Research Committee on February 23rd and 24th, and the New England Fertilizer Conference on February 27th and 28th.

Groups meeting at the Station during 1950 will see a 60-foot panoramic exhibit, depicting the scope of work and contributions to science and agriculture of the Station. Examples have been selected from the earliest years of the Station down to the present day.

Plans for the 75th anniversary observance also include the preparation of a history of the Station, which is now being written. Its author, Director Emeritus William L. Slate, says that "an unusual number of leaders in agricultural science appear in the records—men of color and real stature—beginning with John Pitkin Norton and Samuel W. Johnson, and on to W. O. Atwater, E. H. Jenkins, T. B. Osborne and E. M. East."

### **Penn State to Hold Fertilizer Salesman's School**

Teachers, research workers, and extension men of the School of Agriculture will present a series of talks for a three-day conference of fertilizer salesmen to be held at the Pennsylvania State College, January 30th to February 1st, Dr. H. R. Albrecht, head of the agronomy staff, has announced. Discussions will range from plant growth requirements through soil conditions, and include erosion control, liming, and similar subjects related to growing crops and their fertilizer needs.

## Soil Improvement Scientists to Meet in Chicago

The annual joint meeting of agronomists and soil scientists from 13 Midwestern agricultural colleges with representatives of the fertilizer industry will be held at the Palmer House, Chicago, Ill., on Friday, February 24, according to an announcement by the Middle West Soil Improvement Committee.

Dr. F. C. Bauer, professor of soil fertility at the University of Illinois, will preside. The program will be conducted by the agronomists. During the one day meeting, reports on new research development in soils, crops and fertilizer use will be presented by agronomists from each of the colleges.

A question and answer period covering additional discussion of topics dealt with in the agronomists' reports, will be a feature of the afternoon program.

The meeting provides an opportunity for the exchange of information on fertilizer research between agronomists from different states and for informing the industry about the results of recent studies.

Z. H. Beers, executive secretary of the Middle West Soil Improvement Committee, stated that the meeting is for the benefit of all members of the fertilizer and related industries. All are welcome to attend the meeting.

## Monsanto Appoints New Phosphate Research Directors

A new associate director and three assistant directors of Monsanto Chemical Company's Phosphate Division research department have been appointed by Russell L. Jenkins, research director.

They are Charles B. Durgin, associate director; and Henry V. Moss, Edgar E. Hardy and Christian H. Aall, assistant directors. The appointments became effective January 16th.

Mr. Durgin, a native of New Hampshire, joined Swann Chemical Co., which later became Monsanto's Phosphate Division, in 1922. He has been successively research chemist, chief organic research chemist, group leader and assistant director. Mr. Durgin is a graduate of the University of New Hampshire and did graduate work at George Washington University. In his new assignment, he will be administrative or executive officer of the research department.

Mr. Moss, who has been a research supervisor since 1945, was born of American parents in Mexico City and received his primary

education in that country. He later attended Columbia University and joined Monsanto in 1926. Mr. Moss is responsible for research and development on phosphoric acid and all phosphate salts; application research on phosphates and detergents, and the general food technology program.

Dr. Hardy, who has been a research supervisor since 1945, received his Ph.D degree from the University of Zurich in 1935. He attended the University of Minnesota from 1937 to 1942, when he completed requirements for his Ph.D in organic Chemistry and joined the Phosphate Division's research department the same year. His responsibilities will include research and development work on biphenyl and derivatives and on other organic products. He will also have general supervision of the Phosphate Division's government contract work.

Dr. Aall has been a group leader with headquarters at the division's Columbia, Tenn., plant. A native of Oslo, Norway, Dr. Aall received his doctor's degree in engineering at the University of Grenoble, France in 1938. A year later, the higher degree of Docteur es Science was conferred upon him. He was consultant to Monsanto for a time before joining the division's engineering department as special assistant to the chief engineer in 1947. In 1948 he was transferred to the research department. In his new position, Dr. Aall will be in charge of research and development in connection with the basic operations of the division in Tennessee. He will continue to live at Columbia, Tenn.

## Winter Grazing Tour Planned

A winter grazing tour, sponsored by the Pasture Subcommittee of the Plant Food Research Committee, National Fertilizer Association, in co-operation with Mississippi State College, has been scheduled for February 7 and 8, 1950. The tour will begin at Starkville, Miss., on Tuesday morning, February 7th, continue to Jackson that evening, and end in Biloxi on Wednesday night, February 8th.

Bankers and agricultural editors are particularly invited to participate in the tour, as are fertilizer representatives, agronomists, farmers, animal husbandmen, cattlemen, seedsmen, newspapermen, radiomen, and all others interested in development of a winter-grazing program for the South.

Members of the subcommittee in charge of the tour are J. A. Naftel, chairman, P. J. Bergeaux, B. S. Chronister, A. L. Grizzard, and J. Fielding Reed.

## THE AMERICAN FERTILIZER

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## Carlsbad Potash Mines Resume Operations

The latest news from Carlsbad, New Mexico, is encouraging. Partial production in both the potash mines and the refineries has been resumed. On January 17th, nine cars of potash were shipped out.

Following the granting of a temporary injunction by the Federal court, which restrained the strikers from blockading the mine entrances with pickets and using other unfair labor practices, a back-to-work movement got under way and the companies report that production is returning to normal. The injunction was obtained by the National Labor Relations Board, which told the court that, with the near approach of planting



### POTASH SHIPMENT LEAVING CARLSBAD

Part of a shipment of nine carloads sent out on January 17th. On hand to see the cars leave over the Santa Fe tracks were the plant managers of the three producing companies: (left to right) P. S. Dunn, Potash Co. of America; Nelson White, International Minerals & Chemical Corp.; Henry H. Bruhn, United States Potash Co.

season, a shortage of potash threatened a national crisis, as 85 per cent of the domestic potash supply is produced in Carlsbad.

The strike was called on November 19, 1949, by Local 415 of the International Union of Mine, Mill & Smelter Workers (CIO) on the basic issue of a wage increase. The average hourly wage of the Carlsbad potash miners was \$2.05, which puts them among the highest paid workers in the industry. The three producing companies offered to establish existing wages as a minimum so long as the cost-of-living index remained at 170 or lower. If the index rose above 170, one cent per hour would be added to the wage scale

for every point the index advanced above 170.

This proposal was rejected by the union which demanded a straight 25 cents an hour increase. A strike referendum vote was taken, in which only 1,100 of the eligible 1,600 union members voted. Only 60 per cent of those voting favored going on strike.

The strike has great significance in labor politics. The Mine, Mill & Smelter Workers Union is one of the left-wing CIO branches which is slated for expulsion from the parent organization, having already been suspended for non-payment of dues. If it can achieve its goals in this wage dispute, it will have a powerful argument to use with President Phillip Murray when the show-down comes. Consequently the union has brought in some of its most capable trouble-shooters to direct the strike, including Maurice E. Travis, secretary and treasurer, who recently turned in his Communist Party card so that the union could comply with the requirements of the Taft-Hartley Law.

### Hall Appointed Northern Sales Manager of P.C.A.

Potash Company of America has announced the addition of John W. Hall to its sales staff in the capacity of Northern Regional Sales Manager. Mr. Hall comes to Potash Company of America from the Werthan Bag Company of Nashville, Tenn., which company he had served for a number of years, as Eastern Sales Manager, with headquarters in New York. His headquarters with the Potash Company of America will be at 50 Broadway, New York 4, N. Y.

### Fertilizer Recommendations for Canning Peas

During the war years, Dr. Charles Sayre of the New York Agricultural Experiment Station at Geneva established the fact that more liberal fertilization with nitrogen would not only increase the yield of canning peas in New York, but would improve the quality and would permit another day or two to harvest peas without sacrifice of quality. These are all-important considerations in determining the analysis and amount of fertilizer to be applied for canning peas.

Peas are paid for on a quality as well as a yield basis. Yield increases rapidly near harvest time and an extra day or two often means a substantial increase in yield. This is

desirable if it can be obtained without sacrificing quality.

To get these benefits usually means that 50 pounds of nitrogen per acre must be applied in the fertilizer. New York recommendations this year specify 500-600 pounds of 10-10-10 per acre on sandy soils and 850 pounds of 6-12-6 per acre for loam soils, the fertilizer, of course, to be drilled separately from the seed. — *American Agriculturist, Ithaca, N. Y.*

### Bryant Appointed Tampa Manager by Phillips Chemical

The appointment of J. H. "Jack" Bryant as manager of the Tampa, Florida district of Phillips Chemical Company's fertilizer sales division has been announced by K. S. Adams, president of Phillips Chemical Company and its parent organization, Phillips Petroleum Company.



J. H. Bryant

Mr. Bryant graduated from Mississippi State College in 1936 with a B.S. degree in agriculture. Soon after graduation, he joined The Barrett Division as a Southern nitrogen fertilizer sales representative. During 1944 and 1945 he was a county agent with the Mississippi Extension Service. Most recently, he has been the Southeastern sales representative for the Chemical Department of The Quaker Oats Company.

The Phillips Chemical Company offices in Tampa will be located in the Stovall Professional Building, 305 Morgan Street.



### 1949 Tag Sales Top 1948 Total

Complete returns for November and reports from a number of States for December reveal that the fertilizer tonnage represented by sales of tax tags and manufacturers' reports of shipments in 14 Southern and Midwestern States during 1949 exceeded the 1948 total by at least several hundred thousand tons.

The National Fertilizer Association reports that during November, tag sales and fertilizer

shipments in the 14 States totaled 489,000 equivalent short tons as compared with 568,000 during the same month of 1948, but that the January-November total of 9,194,000 tons exceeds that of the first 11 months of 1948 by approximately 638,000 tons. The gains reflected in these figures were due almost entirely to increase tonnages reported by the Southern States, all 11 of which reported higher figures for January-November 1949

(Continued on page 26)

#### FERTILIZER TAX TAG SALES<sup>1</sup> AND SHIPMENT TONNAGES<sup>2</sup>

(In Equivalent Short Tons)

COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

State	November		Calendar Year Cumulative January-November		Fiscal Year Cumulative July-November	
	1949	1948	1949	1948	1949	1948
Virginia (t).....	13,569	18,577	655,642	602,306	161,655	159,947
N. Carolina <sup>3</sup> .....	22,189 <sup>2</sup>	79,646	1,418,355	1,402,876	157,469	316,492
S. Carolina (t).....	49,598	46,650	910,312	827,120	147,740	179,452
Georgia (t).....	45,493	79,958	1,188,708	1,132,607	172,286	212,691
Florida (t).....	112,455	91,229	858,019	662,404	342,556	262,555
Alabama (t).....	42,522	39,821	1,012,788	901,618	135,936	126,404
Tennessee (t).....	27,177	41,339	448,084	421,263	87,352	115,324
Arkansas (t).....	14,650	17,808	316,545	230,608	49,368	66,097
Louisiana (r).....	11,292	17,062	230,999	182,054	45,854	53,097
Texas (r).....	52,923	21,283	477,461	435,120	187,613	177,357
Oklahoma (r).....	2,307	3,500	122,198	120,486	51,188	45,000
<i>Total South.....</i>	<i>394,175</i>	<i>456,873</i>	<i>7,639,111</i>	<i>6,918,462</i>	<i>1,539,017</i>	<i>1,714,416</i>
Indiana.....	62,916	63,949	672,475	746,349	307,155	337,648
Kentucky.....	29,754	45,108	446,752	499,443	112,337	156,711
Missouri.....	2,010	2,413	435,727	391,296	149,320	155,645
<i>Total Midwest.....</i>	<i>94,680</i>	<i>111,470</i>	<i>1,554,954</i>	<i>1,637,088</i>	<i>568,812</i>	<i>650,004</i>
<i>Grand Total.....</i>	<i>488,855</i>	<i>568,343</i>	<i>9,194,065</i>	<i>8,555,550</i>	<i>2,107,829</i>	<i>2,364,420</i>

<sup>1</sup> The letter (t) denotes States whose data are based on sales of fertilizer tax tags. The figures are the number of short tons of fertilizer represented by the tags sold to fertilizer producers who are required by law to attach one to each bag of fertilizer they sell in these States. The tonnage so represented may be somewhat larger or smaller than actual amounts of fertilizer sold, because of the lag between the purchase of tags and the delivery of fertilizer on which those tags are used.

<sup>2</sup> Current tonnage figures for States whose names are followed by (r) are the shipments of fertilizer for use in these States as reported by manufacturers to the appropriate State agencies.

<sup>3</sup> North Carolina law permits each manufacturer either to use tax tags or to submit monthly reports on the amounts of fertilizer shipped in the State. Current figures are the total (unduplicated) number of short tons of fertilizer represented by both tax tag sales and manufacturers' reports.

<sup>2</sup> Estimated.

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**FERTILIZER MATERIALS MARKET****NEW YORK**

**Prolonged Strike in Potash Mines Seriously Affects All Branches of Fertilizer Industry. Many Mixers Forced to Stop Operations. Supplies of Other Materials Accumulating. Some Price Cuts in Sulphate of Ammonia and Superphosphate Reported. Organic Materials Still in Good Demand.**

*Exclusive Correspondence to "The American Fertilizer"*

NEW YORK, January 18, 1950

**Sulphate of Ammonia**

One large by-product producer cut the price of this material \$3.00 per ton to \$45.00 per ton in bulk and some of the other producers are expected to follow. Material is accumulating at certain production points on account of the inability of the producers to secure necessary shipping instructions from fertilizer people because of the potash strike.

**Nitrate of Soda**

Stocks on hand were adequate at most points with little material reported moving. No price changes were reported.

**Nitrogenous Tankage**

With most leading producers sold up for the next 90 days, this material was in short supply for quick shipment.

**Castor Pomace**

With last sales at \$27.50 per ton, f.o.b. production points, producers were not offering. The market was very firm and considerable inquiry developed for this material. Imported material was held at higher prices.

**Organics**

Organics were still in demand by the fertilizer and feed trade, with prices of these materials steady. Tankage and blood sold at \$8.25 per unit of ammonia (\$10.02 per unit N), f.o.b. Eastern shipping points, and supplies were well cleaned up. Soybean meal was slightly easier in price and sold at \$54.00 per ton in bulk, f.o.b. Decatur, Ill., with cottonseed meal at \$58.00 per ton, f.o.b. Southeastern points, for prompt shipment. Linseed meal continued to sell on basis of \$70.00 per ton in bulk, f.o.b. Minneapolis.

**Fish Meal**

Various lots of imported fish meal were offered both for shipment and spot at prices slightly under domestic market. Feed buyers took on limited quantities but fertilizer buyers showed little interest. Some re-sale lots of menhaden fish meal were offered from time to time.

**Bone Meal**

A good demand was evident from the fertilizer trade and even feeding bonemeal was in better demand but supplies of feeding bone meal were adequate at most points.

**Hoof Meal**

Sales were made on the basis of \$7.50 per unit of ammonia (\$9.12 per unit N), f.o.b. Chicago, with the market well sold up. Most of the material moving to fertilizer buyers.

**Superphosphate**

One large manufacturer cut the price of this material 4 cents per unit, effective at once, which was a reduction of about 80 cents per ton. This is expected to provide a better movement of this material. Other producers are expected to follow this price cut and adjust their prices accordingly.

**Potash**

With the strike still in force, pressure was being brought by fertilizer people on various Government agencies to step in and try and stop the strike. So far no action has been taken. In the meantime, many small fertilizer plants have been forced to cease operations, due to lack of potash.

**Conditioners**

Low grade ammoniates were not moving very briskly on account of the potash strike and most producers were having trouble getting buyers to take material as they have no potash to mix with it.

## CHARLESTON

### Potash Strike Continues to Cripple Production of Mixed Fertilizers. Superphosphate Output Curtailed. Organic Materials Scarce.

*Exclusive Correspondence to "The American Fertilizer"*

CHARLESTON, January 16, 1950

The availability of potash is of prime concern to fertilizer manufacturers now. Superphosphate stocks are adequate to heavy. Organic nitrogen is scarce.

**Organics.**—Organics are definitely tight, with nitrogenous producers sold up through April. Imported nitrogenous offerings are scarce. Castor pomace production is completely sold and January forward additional supplies uncertain.

**Castor Pomace.**—Movement is entirely against existing contracts and although the price is nominally \$27.50 in bags, f.o.b. Northeastern production points, no new offerings from producers are in the market.

**Dried Ground Blood.**—Chicago market is nominally \$7.75 to \$8.00 per unit of ammonia (\$9.42 to \$9.72 per unit N), in bulk with the New York market at around \$9.00.

**Potash.**—The Carlsbad strikes at this writing are still in effect and it is estimated that production lost to date is approximately 400,000 tons of material. This will doubtless mean pro-ration of supplies when the mines again begin operating and the situation is quite serious.

**Ground Cotton Bur Ash.**—This material, primarily in the form of carbonate of potash and testing 30 per cent to 40 per cent  $K_2O$ , is in active demand, last sales being made at 65 cents per unit of  $K_2O$  in bulk, f.o.b. Texas shipping point.

**Phosphate Rock.**—Due to heavy stocks of superphosphate on hand and the effects of the shortage of potash on mixing operations, phosphate rock movements are reported only fair. Prices continue firm.

**Superphosphate.**—Superphosphate stocks are heavy, demand slow and because of lack of potash, production of Superphosphate has been curtailed rather generally. Prices in certain areas have shown slight decreases.

**Sulphate of Ammonia.**—Supplies of coke oven and synthetic production appear entirely adequate and prices range from \$40.00 to \$45.00 per ton, in bulk, f.o.b. the ovens.

**Ammonium Nitrate.**—The Canadian production is reported entirely under contract for this season. Demand continues active and the market firm.

**Nitrate of Soda.**—Demand is seasonal and supply position is comfortable. No changes in prices have been noted recently.

## CHICAGO

### Organics Market Shows Firmer Tone. Further Advances Expected During Bad Weather Conditions.

*Exclusive Correspondence to "The American Fertilizer"*

CHICAGO, January 16, 1950

The market on animal ammoniates in the Chicago area has been fairly steady with a firm undertone. The stronger situation on the east coast, resulting from the lifting of export restrictions, has not yet been reflected in this area. However, it is anticipated that if a heavy export demand should develop, the market here will also advance. Even without an increased export demand, prices should hold or advance, in view of the bad weather creating a broader buying interest for proteins.

Ground and sacked meat scraps, 50 per cent protein, are steady at \$105.00 to \$110.00 per ton. Digester tankage, 60 per cent protein, \$118.00 to \$120.00 per ton. In most instances these prices are f.o.b. shipping points. Dry rendered tankage last sold at \$1.90 per unit of protein delivered, but sellers of further quantities are quite firm at \$2.00 per unit. Wet rendered tankage ranges from \$9.25 to \$9.50

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per unit of ammonia (\$11.24 to \$11.55 per unit N) for low testing product and \$8.75 or \$9.00 (\$10.63 to \$10.94 per unit N) for high testing goods. Dried blood is unchanged at \$7.75 to \$8.00 per unit of ammonia (\$9.42 to \$9.72 per unit N) delivered. Steamed bone meal, 65 per cent B.P.L., bagged, \$70.00 to \$80.00 per ton, and raw bone meal, 4½-45 per cent, at \$75.00 per ton.

### PHILADELPHIA

**Demand for Mixed Goods Improving, but Strike-Bound Potash Halts Mixing Operations. Other Materials in Ample Supply.**

*Exclusive Correspondence to "The American Fertilizer"*

PHILADELPHIA, January 16, 1950

The potash strike continues to be the main feature of the materials market. All materials are in ample supply except potash, and possibly certain organics. Blood and tankage are at the moment somewhat easier. Orders for mixed goods are picking up, especially in the south.

**Sulphate of Ammonia.**—No price changes are reported, and while the producers are well fortified with contract orders for future delivery, movement is slowed down by inability of many buyers to receive shipments at this time. There is little or no demand in the open market.

**Nitrate of Soda.**—Demand continues seasonal and supplies are quite sufficient to meet all requirements. Rumors of a price cut in Chile are not expected to affect prices in the United States.

**Blood, Tankage, Bone.**—At the moment blood and tankage are easier at \$8.00 to \$8.25 per unit of ammonia (\$9.72 to \$10.02 per unit N), in Chicago, and \$7.75 to \$8.00 (\$9.42 to \$9.72 per unit N) in New York area. Bone meal is quoted at \$65.00 in the west, with stocks sufficient to meet present requirements. Hoof meal is reported in light supply at \$7.50 per unit of ammonia (\$9.12 per unit N) in Chicago.

**Castor Pomace.**—There is a good demand for this material for certain types of mixtures, but none is offered at the present time. The production is said to be disappointing in quantity.

**Fish Scrap.**—Market is quiet with not much offering. \$170.00 per ton is quoted for menhaden meal.

**Phosphate Rock.**—Stocks are quite ample for all requirements but movement is considerably delayed by lack of storage room at acidulators' plants.

**Superphosphate.**—Prices are reported a little

easier in some areas but shipments are still held back, due to choked condition of many of the mixing plants, some of whom have been obliged to close down entirely, waiting for potash. However, orders from farmers are coming in more freely.

**Potash.** The strike is still on and while there is a tremendous demand from all quarters for potash for spot delivery, there is no resale obtainable. The chemical people are now also feeling the effect of the strike, and it is recognized that the production lost during this recent period cannot possibly be made up in the remainder of the present fertilizer season.

### Staley Made General Sales Manager of Duriton Co.

Wayne D. Staley, formerly New York District Manager for The Duriron Company, has been appointed General Sales Manager and will be located at the home office of the company in Dayton, Ohio. In directing sales and advertising activities, he will replace D. E. Jack, who has resigned as Vice President in charge of Engineering and Sales.

R. F. Sharpe, former manager of the Philadelphia office, has been appointed New York District Manager.

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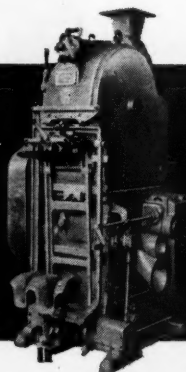




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## November Superphosphate Production

Superphosphate production in the United States during November was approximately 4 per cent higher than in October and was about the same as during November, 1948. A compilation of reports received by The National Fertilizer Association plus a summary of reports submitted to the Bureau of the Census reveal that the month's output of the various types of superphosphate totaled, in terms of 18 per cent available phosphoric acid content, 851,000 short tons. This figure covers manufacture of 184 acidulating plants which account for practically all U. S. production.

The 851,000 tons break down into the following components: 727,000 tons of normal superphosphate (basis 18 per cent A.P.A.), 4,114 tons of wet base goods (basis 18 per cent A.P.A.), and 48,000 tons of concentrated product (basis 45 per cent A.P.A.). A total of 9,672,000 equivalent short tons of 18 per cent product was turned out during the first 11 months of 1949 as compared with 9,730,000 tons during the same period of 1948.

At the beginning of November, acidulators' stocks amounted to 1,260,000 short tons.

	Normal 18% A.P.A. Tons	Concentrated 45% A.P.A. Tons	Base Goods 18% A.P.A. Tons
Production			
November, 1949.....	727,339	47,778	4,114
October, 1949.....	679,512	52,930	4,887
November, 1948.....	749,265	39,505	5,433
Shipments and Used in Producing Plants			
November, 1949.....	695,304	43,165	2,055
October, 1949.....	716,914	46,386	2,739
November, 1948.....	728,884	43,038	3,546
Stocks on Hand			
November 30, 1949.....	1,039,037	102,567	16,662
October 31, 1949.....	1,000,444	97,954	14,603
November 30, 1948.....	1,156,656	75,443	12,667

Adding the month's output to this figure and subtracting shipments of 496,000 tons and quantities used in the reporting plants in the making of mixed goods—310,000 tons—leave stocks on hand at the end of November totaling 1,312,000 tons. This figure is slightly below that reported a year ago.

## Tupper Joins Fulton Bag Co.

Fulton Bag & Cotton Mills has announced that Thomas J. Tupper, Jr., has joined their sales force, and will make his headquarters in Kansas City. Mr. Tupper will devote his major efforts to the sale of Multiwall bags in the Midwestern area. He has had several years experience in this field.

## North Carolina Soil Testing Service Aids Farmers

By DR. WERNER L. NELSON

*Director, North Carolina Soil Testing Laboratory*

Many farmers are now taking advantage of the opportunity to have their soils tested and thus are learning what lime and fertilizer their soils need. This service is carried on by the Soil Testing Division of the North Carolina Department of Agriculture with no charge to the farmer. It was begun in 1939 and since then the number of samples tested has been increasing rapidly. Last year over 60,000 samples were tested.

Soils vary greatly in the amounts of lime and fertility elements they contain. A recent summary of soil testing data showed that in Guilford County, for example, 48 per cent of all the soils analyzed were low or very low in available phosphorus, 16 per cent medium, and 36 per cent high or very high. Much of this difference is due to differences in the past

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cropping and fertilization practices carried on by the farmers.

Soil tests are necessary in order that proper amounts of lime be applied. In the first place soils vary greatly in acidity and, hence, vary greatly in their need for lime. A very sandy soil at pH 4.5 may require only one ton of lime to bring it to pH 6.5, while dark colored soils or clay loams at pH 4.5 may require three to five tons to bring them to the same pH. When soils are analyzed by the Soil Testing Division determinations are made for pH, texture of the soil and content of organic matter, calcium and magnesium, and all of these values help to make a correct liming recommendation to you farmers.

Soil tests will help the farmer choose his fertilizer so as to correct low levels of either phosphorus or potash in a soil. For example, if the soil in a Ladino pasture tests low in potash, an 0-10-20 top-dresser will be much more effective than an 0-14-7 fertilizer. If a soil to be planted in alfalfa is low in phosphorus an application of superphosphate is recommended in addition to the 2-12-12 ordinarily used at planting.

In 1948, North Carolina farmers used 1,700,000 tons of fertilizer—more fertilizer than any other state. This means that the farmers realize the importance of adequate fertilization. With this tremendous tonnage to fertilizer it is important that the proper grades be used on every field. The analyses of the soil before fertilizers are applied will do much toward proper utilization.

Another important use for soil tests is in the diagnosis of troubles appearing on crops already growing in the field. Sometimes the trouble may be identified by characteristic deficiency symptoms on the plants. Often, however, deficiency symptoms are confused by disease or insect damage and soil tests help to locate the cause of the difficulty. Recently, a grower sent in a soil sample from a Ladino

pasture. He stated that the plants were yellow and were dying. An analysis of the soil showed it to have a pH of 5.0. The chances were quite good that the cause of his trouble was due to the lack of lime.—*Agricultural Review, Raleigh, N. C.*

### Federal Trade Commission Criticizes Fertilizer Industry

The Federal Trade Commission has completed a comprehensive investigation of the fertilizer industry in which conclusions are reached that are highly critical of the costs of fertilizer distribution and of the attempts of some of the large integrated mixers to dominate the pricing practices of their small competitors.

The investigation was made by the committee under its general authority to gather factual data of economic and business conditions for the purpose of keeping congress and the public informed, and the report is now in the hands of the government printer.

The report is concerned primarily with restrictions and wastes which interfere with the supply of plant food materials in the quantities needed and at prices low enough to facilitate maintenance of soil fertility. The nation's resources of nitrogen, phosphate, and potash are discussed in some detail and the corporate and business relations of producers of these materials to each other, as well as to fertilizer mixers, are reviewed.

Commenting on the study in its annual report that went to congress previously, the commission stated that its studies show that the costs of distributing fertilizer are high largely because mixers adhere to long-standing formulas that provide for the addition of inert substances to specified percentages of the three important plant foods.

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long freight haul, the buyer must pay unnecessary charges for transportation of inert materials," the commission said. "For years, farm organizations, state agricultural colleges, and other public agencies have urged that costs of distribution be reduced, but little progress has been made toward increasing the plant food content of commercial fertilizers."

The report notes that proposals have frequently been made for a national fertilizer program designed to make materials with high plant food content available to independent mixers in remote regions and points to the need for additional information relevant to any such plans that may be undertaken.

The report also describes restrictions imposed upon independent mixers by large integrated mixers upon whom the former are dependent for materials, especially phosphates. The nonintegrated mixers, including farmers' cooperatives, it was stated, often find that they must refrain from competing in price in the sale of mixed fertilizer if they are to continue to receive needed materials.

The report reviewed four suggested methods of reducing fertilizer costs to farmers, such as locating producing plants closer to consuming areas; permitting farmers to buy plant food as separate materials holding the plant food in a given formula constant, and increasing the plant food content of a mixed fertilizer with purchases to be made on a plant food basis. The report took no definite stand on which of the four methods is most desirable.

### Agricultural Conservation Program Expanded in 1949

Soil and water conservation practices, adapted to local conditions and needs, were carried out on approximately 2,900,000 farms in the United States and Insular Territories under the 1949 Agricultural Conservation Program, Ralph S. Trigg, administrator of the Production and Marketing Administration, U. S. Department of Agriculture, has reported.

"This is a preliminary figure," Mr. Trigg stated, "but it indicates how widely the assistance given by this program has been used. It has made it possible for nearly three million farmers to carry out essential conservation

practices on their farms. The assistance given by the program, in the form of conservation materials and services and financial aid, has covered about half the 'out-of-pocket' cost of the practices carried out under the program.

"This Government assistance has helped to speed up the adoption on a wide front of the improved methods of conservation and soil improvement resulting from agricultural research. It has added to the effectiveness of the educational and demonstrational work of the U. S. Department of Agriculture, and it has made possible increased use of the technical knowledge and skills of the Department."

The 1949 ACP was administered in the Nation's more than 3,000 agricultural counties by locally elected farmer-committeemen. These committeemen, together with soil and crop specialists and technicians of the Extension Service, Experiment Stations, Land-Grant Colleges, Soil Conservation Service and others, helped to develop and formulate the provisions of the 1949 ACP.

Farmers cooperate in the Program by carrying out on their farms the conservation practices approved for meeting the conservation problems of their individual farms.

Since 1936, farmers cooperating in the Agricultural Conservation Program have constructed terraces on 17 million acres of land; constructed 900 thousand dams for livestock water, erosion control and for irrigation; used 240 million acres of green manure and cover crops to restore humus and organic matter to the soil; seeded 45 million acres of range

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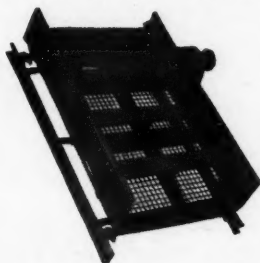


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and pasture land to grass and legumes; applied 235 million tons of lime to improve the growing conditions for grass and legumes; applied 20 million tons of phosphate to make possible the establishment and adequate growth of soil conserving crops; planted 750 thousand acres of trees along with many more conservation practices.

Since the beginning of the Program more than half the farmers in the United States, operating more than two-thirds of the Nation's cropland, have cooperated in the ACP. It is being used to conserve soil and water in every agricultural county in the United States.

### Potatoes Need More Potash Than Most Crops

To maintain large potato yields, more fertilizer is required, especially more potash, says John Bushnell, horticulturist at the Ohio Agricultural Experiment Station.

With crops of 400 to 500 bushels per acre on well drained sandy loams, the tubers themselves remove 140 to 200 pounds of potash. To supply this in the form of 5-10-10 fertilizer, 1,400 to 2,000 pounds per acre are required.

As the expense of fertilizer thus becomes a considerable item, the Ohio grower planning for potatoes is advised to consider first the probable yield that his land will produce. Most potato growers realize the productive capacity of their soils, and wherever the yield is not likely to exceed 300 bushels per acre, the recommended fertilizer is 1,000 pounds of 5-10-10.

Many Ohio soils will not produce over 300 bushels because they are not porous enough and do not drain rapidly enough for potatoes. On the other hand, on the best drained sandy soils, drought in midsummer is likely to be the limiting factor.

Growers who are equipped to irrigate, as an increasing number are on sandy soils, and look forward to yields of 500 bushels per acre or even more, need to apply 1,500 pounds or more of fertilizer. A mixture of fertilizer may prove more economical than straight 5-10-10. Experiments have demonstrated that big

crops of potatoes need more potash, rather than more phosphate and nitrogen. Fertilizers with a higher proportion of potash, such as 3-9-18, are regularly available for muck soils. A mixture of 100 pounds of 5-10-10 with 600 pounds of 3-9-18 should prove just as satisfactory as 2,000 pounds of 5-10-10.

### 1949 TAG SALES

(Continued from page 14)

than for the same period a year earlier. Of the three Midwestern States which have reporting programs, only Missouri showed a rise; Kentucky reported a slight drop, while Indiana recorded a substantial decline. The equivalent January-November tonnage for the South totals 7,639,000 as compared with 6,918,000 a year ago, while Midwest figures for the first 11 months of the year just ended add up to 1,555,000 tons as compared with 1,637,000 tons during the corresponding period of 1948.

Among the States with tag sale or shipment reporting programs, North Carolina continues to lead with a total of 1,418,000 tons, and is followed by Georgia with 1,189,000 tons and Alabama with 1,013,000 tons.

Cumulative tonnages to date for the current fiscal year are substantially lower than corresponding figures of a year ago for both the South and the Midwest. The July-November totals of 1,539,000 tons for the South and 569,000 tons for the Midwest represent declines of 10 per cent and 12 per cent respectively from comparable 1948 figures.

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**GRASSLAND FARMING**

(Continued from page 9)

"I have seen good farmers take a beating—I have taken a beating myself—amounting to as much as the normally to be expected labor income and I don't like it.

"Years ago I used to cock such hay up by hand and cure it under caps but that is out. It costs too much. Then I started ensiling it with molasses as a preservative and, so far as I am concerned, that is the answer.

"I read a publication a few days ago in which the author maintained that it involves no increase in investment or expense to change over to grassland farming. I wish he were right. It may be that he is if he already had the silo capacity or a mow drier and if he is willing to handle that heavy green stuff from the loader on the load and off the load into the blower with a pitchfork but I am not. And they don't give away field choppers, tractors to haul them, trailer wagons and all that

"But even so, elimination of the usual loss of feeding value in handling the first cutting warrants the investment, provided the farm is big enough to carry the overhead of the requisite mechanical equipment. But it does take a lot more farm than it used to take to constitute a family size farm."

**Grassland Program for the South***W. R. Thompson*

To wind up the program, W. R. Thompson, Extension Pasture Specialist, Mississippi State College, really demonstrated with freshly cut material the difference between broomsedge which cattle will not eat unless starved to it, low-yielding mediocre pasture, and abundant succulent pasture. He demonstrated without a question of a doubt that the first job was to eliminate undesirable grasses and establish potentially high yielding and palatable grasses and legumes. He emphasized the importance of plenty of fertility in establishing these de-

sirable grasses and legumes, but he has observed that too many farmers then neglect the all important fertilization and management practices. He said that pastures and legumes just like any other crop must be liberally fertilized every year if the farmer expects to harvest a profitable crop of milk or meat every year.

**A Summary***Kirk Fox*

Kirk Fox, Editor of *Successful Farming*, who presided over the meeting, defined grassland farming as "a system of husbandry in which grass crops are used to the limit of their economic possibility."

Mr. Fox further predicted that many acres of pastures east of the Missouri River will be irrigated, and expressed need for an immediate program to study the limitations and possibilities of irrigation.

He further said, "The major part of the farm manure and commercial fertilizers is now applied to row crops on farms. A shift is indicated, or better yet, an increase in the total amount of fertilizer used per farm. Grasslands have demonstrated their ability to use large quantities of plant food profitably."

Mr. Fox says definitely that fertilizer is not the whole answer. He said, "Soil structures across the Midwest are rapidly going to ruin under the impact of commercial fertilizers inadequately cushioned by humus or organic matter in the soil. The fine roots of grass and the deep penetrating roots of legumes are a must in a program of soil structure management. To protect soil from erosion, they are also essential."

Mr. Fox concluded his summary remarks with this statement. "If you would succeed with grass it is essential that you have ample cash or resources to operate efficiently and on large enough scale to insure a satisfactory standard of living."

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Stedman Foundry and Mach. Works, Aurora, Ind.

### SCREENS

Atlanta Utility Works, The, East Point, Ga.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Company, Boston, Mass.  
Universal Vibrating Screen Co., Racine, Wis.

### SEPARATORS—Air

Sackett & Sons Co., The A. J., Baltimore, Md.  
Sturtevant Mill Co., Boston, Mass.

### SPRAYS—Acid Chambers

Monarch Mfg. Works, Inc., Philadelphia, Pa.

### SULPHATE OF AMMONIA

American Agricultural Chemical Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City  
Barrett Div., Allied Chemical & Dye Corp., New York City  
Huber & Company, New York City  
Jackle, Frank R., New York City  
Lion Oil Co., El Dorado, Ark.  
McIver & Son, Alex. M., Charleston, S. C.  
Phillips Chemical Co., Bartlesville, Okla.  
Scar-Lipman & Co., New York City  
Woodward & Dickerson, Inc., Philadelphia, Pa.  
Woodward Iron Company, Woodward, Ala.

### SULPHUR

Ashcraft-Wilkinson Co., Atlanta, Ga.  
Texas Gulf Sulphur Co., New York City

### SULPHURIC ACID

American Agricultural Chemical Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City  
Huber & Company, New York City  
International Minerals & Chemical Corporation, Chicago, Ill.  
McIver & Son, Alex. M., Charleston, S. C.  
Southern States Phosphate Fertilizer Co., Savannah, Ga.  
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.  
Virginia-Carolina Chemical Corp., Richmond, Va.

### SUPERPHOSPHATE

American Agricultural Chemical Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City  
Davison Chemical Corporation, Baltimore, Md.  
Huber & Company, New York City  
International Minerals & Chemical Corporation, Chicago, Ill.  
Jackle, Frank R., New York City  
McIver & Son, Alex. M., Charleston, S. C.  
Southern States Phosphate Fertilizer Co., Savannah, Ga.  
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.  
Virginia-Carolina Chemical Corp., Richmond, Va.

### SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.  
International Minerals & Chemical Corporation, Chicago, Ill.  
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.  
Virginia-Carolina Chemical Corp., Richmond, Va.

### TANKAGE

American Agricultural Chemical Co., New York City  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City  
Davidson Commission Co., The, Chicago, Ill.  
International Minerals & Chemical Corporation, Chicago, Ill.  
Jackle, Frank R., New York City  
McIver & Son, Alex. M., Charleston, S. C.  
Woodward & Dickerson, Inc., Philadelphia, Pa.

### VALVES

Atlanta Utility Works, The, East Point, Ga.  
Monarch Mfg. Works, Inc., Philadelphia, Pa.

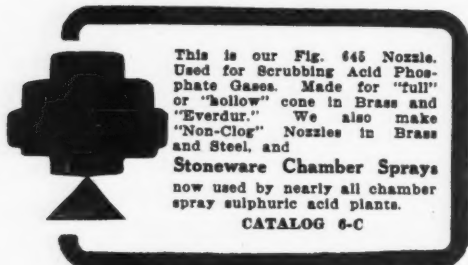
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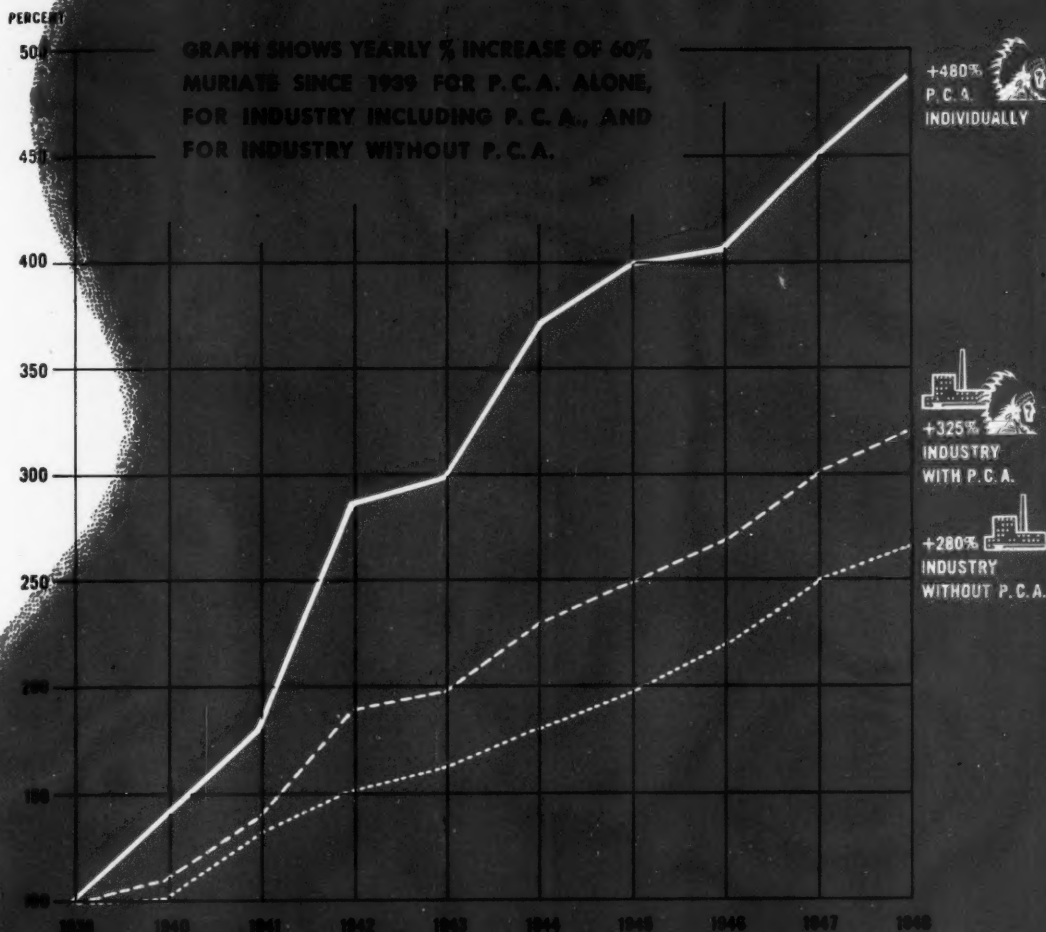
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95% of all P.C.A.'s '48 deliveries were in the form of 60% Muriate. Our new \$4,000,000 production and refining facilities now are operating. Our deliveries for '49-'50 will break all previous records. In fact, P.C.A.'s production capacity for 60% Muriate this year will exceed by some 150,000 tons the entire potash consumption—all grades—of the nation ten years ago.

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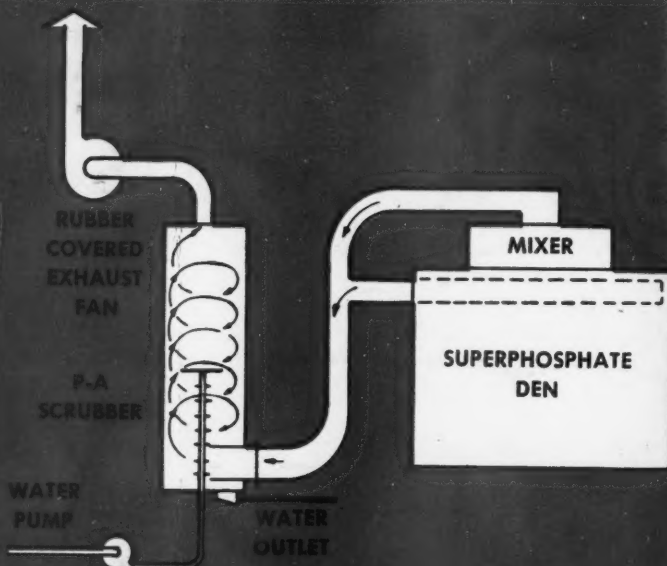
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